

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REPORT ON THE BLACK-HEADED BUDWORM CONTROL PROGRAM
IN
GLACIER NATIONAL PARK - 1957

By J. W. Emmert, Superintendent
Glacier National Park



November 4, 1957

Memorandum

To: Regional Director, Region Two

From: Superintendent, Glacier National Park

Subject: Report on Black-headed Budworm Control Program, Glacier National Park

FOREST SERVICE
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FOREST INSECT LAB.
MISSOULA, MONT.

There is being submitted a report on the Black-headed Budworm spray operation conducted in Glacier National Park on July 22, 1957.

(Sgd) J. W. Emmert

J. W. Emmert
Superintendent

In duplicate

Attachment

cc: Ernest J. Grambo ✓
Philip C. Johnson ✓
Maynard Barrows

Johnson.....✓
Keith.....
Blair.....
Nelson.....
Denton.....✓
Dodge.....
Pellin.....✓
McComb.....✓
Terrell.....✓
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Report On the Black-headed Budworm Control Program
in
Glacier National Park - 1957

On Friday, July 27, 1956, Supervisory Park Ranger A. D. Cannavina received a phone call from Mrs. Genevieve W. Gudger informing that some insects appeared to be working on the hemlock as indicated by frass which covered her car while it was parked under a hemlock tree. That same day Mr. Cannavina drove to the Gudger residence at the head of Lake McDonald and examined the hemlock trees. Numerous green larvae were observed feeding upon hemlock foliage. Samples were collected and brought to Park Headquarters where Mr. Cannavina identified them as what appeared to be the black-headed budworm (*Acleris variana*).

On Monday, July 30, 1956, the Forest Insect Laboratory personnel were informed of the insect damage and during mid August, entomologists from the laboratory made ground examinations. On August 31, 1956, Tom Terrell, Entomologist from the Forest Insect Laboratory made an aerial survey over the infested area and estimated 5,200 acres of visible damage. The insect causing the damage was identified by entomologist from the Forest Insect Laboratory as the black-headed budworm (*Acleris variana*). There was sufficient damage to the hemlock stand to be considered an epidemic which would endanger the entire McDonald valley if it continued uncontrolled.

A decision to control the infestation was made after a meeting with Park officials and Forest Insect Laboratory personnel on October 23, 1956. Superintendent Smart recommended the project in a memorandum to the Regional Director, Region Two, dated November 29, 1956.

During the winter of 1956 and spring of 1957, entomologists from the U. S. Forest Insect Laboratory studied the life history and made egg counts of the black-headed budworm to determine whether the epidemic would continue if left to natural causes for control. High egg counts indicated natural enemies were not sufficient to stem the attack and action was taken to contract for a spray job.

The Forest Service Division of Timber Management with Ernest J. Grambo, Project Director, negotiated a contract for control with United Heckathorn, Inc., on June 29, 1957, for the National Park Service. Funds to cover this contract were allotted directly to Region One, Forest Service, from Washington.

Personnel from the Forest Insect Laboratory headed by Entomologist David McComb, continued development studies of the insect during June and July, 1957. The development stage of the larvae indicated that July 22 would be the date most suitable for spraying. On July 22, 1957, an area of 6,375.1 acres was sprayed using one pound of finished approved insecticide

per acre. Six thousand acres were sprayed by a C-82 and 375.1 acres sprayed by a N3N plane, operating from the Flathead County Airport with U. S. Forest Service, Missoula Insect Laboratory and National Park Service personnel participating. The N3N plane was used to spray the Avalanche basin which was too narrow and deep for the big C-82 plane.

Costs of the project were as follows:

United Heckathorn, Incorporated

6,375.1 acres sprayed at \$0.44 per acre	\$2,805.04
Insecticide 6,500 gallons at \$0.47735 per gal.	3,102.78
Loading station at airport	420.00
Tank truck standby at \$5.00 per hour 5:00 a.m. to 1:00 p.m.	40.00
Pumpman	25.00
Observation plane 5.5 hours @ \$26.50 per hour	145.75
Payment by U.S. Forest Service to Contractor	\$6,538.57
Forest Service costs including biologists, checks travel, etc.	_____
Forest Insect Laboratory Costs	_____
National Park Service costs	97.83

I. Administrative Aspects of the Control Program

1. McDonald Valley control unit. Glacier National Park, Montana, 1957.
2. From around head of Lake McDonald to Packer's Roost above Logan Creek. See attached map. Total acreage treated 6,375.1 acres.
3. High intensity of infestation by the black-headed budworm (*Acleris variana*).
4. Estimate 60 - 80 percent defoliation of all age classes of western hemlock.
5. Duration of project:
 - a. Beginning of insect development to date of spraying. June 15 to July 22, 1957.
 - b. Period of spraying operations: July 22, 1957
 - c. Final mortality checks: August 5, 1957.
6. Aerial survey of area made by Tom Terrill on August 31, 1956 to determine approximate number of acres damaged. Attached maps show area infested as determined from the air.
7. Aerial spray used with approved insecticide at the rate of 1 pound per acre.
8. Aircraft used one C-82 with spray nozzles covering a 600 foot spray and one N3N with a spray nozzle covering 100 feet spray. N3N was used to spray the narrow deep Avalanche basin where it was not considered safe to put the big C-82.

9. Spray block - one strip as shown on map.
10. Handled by Forest Service - 15 man days for Entomologist McComb
10 man days for 2 helpers.
11. Parcels of private land were so small as to be negligible.
12. The contractor's ground organization appeared to be adequate,
well organized and easy to work with.

The entire spray operation was well organized and handled entirely by the Forest Service with Ernest J. Grambo as Project Director. The Park Service contributed assistance as required. Communication between planes and ground crews was satisfactory and while the job was small in comparison to other spray projects, there did not appear to be any phase of the operation which could be considered poorly handled.

Much credit and appreciation is given to all representatives of the Forest Service for handling this project in Glacier National Park for without their cooperation, the job would have been a difficult one for us to handle.

We also wish to express our special appreciation to Forester Maynard Barrows who was most helpful and cooperative in providing assistance to Glacier in the organization of the project as well as flying as an observer during the spraying operations.

Mortality checks taken by Entomologist David McComb on August 5, 6 and 7, 1957, showed 98.2 percent mortality which was the average for the entire spray job. This would indicate a high percent kill and should reflect in the 1957-58 egg count.

J. W. Emmert
Superintendent

cc: Regional Director, Region Two (2)
Ernest J. Grambo, Project Director
Philip C. Johnson, in Charge, Forest Insect Lab.
Maynard Barrows, Forester, Yellowstone
ADCannavina, Glacier

~~APRIL~~ OBSERVATION REPORT
Spruce Budworm Control

1. Plane C-82 ^{1000 gal.} Spray Block Glacier Time 4:40-5:22
2. Swath width 300' 1st strip
600' 2nd strip
3. Swath location w/respect to previous swath Contour up hill
4. Spray plane height 150'
5. Leaks or plugged nozzles None
6. Spray action Settled in good
7. Spray pattern near lakes or streams 1 boom used 1st 2 strips UNCD
8. Is the spray plane in proper block? yes

Date 7/22 195 7 Observer Barrows

Remarks:

Small spray area over headquarters 2 strips.

AERIAL OBSERVATION REPORT
Spruce Budworm Control

1. Plane C-82 1200 gal. Spray Black Glacier Time 5:33 - 6:15 a.m. ^{2nd flight}
2. Swath width 300' 3rd strip finished 4 and 5
600' 6th strip, 300' part way
3. Swath location w/respect to previous swath up hill
4. Spray plane height 150' 200'
5. Leaks or plugged nozzles none
6. Spray action Settled good, some oil on lake from last flight
7. Spray pattern near lakes or streams O.K.
8. Is the spray plane in proper block? yes
Date 7/22 1957 Observers Barrows and Cannavina

Remarks:

3rd flight, C-82, 7/22, 1300 gal. 6:54 - 7:21 a.m.

7th strip - 1 and 2 booms 300' - 600'

8th strip - short on N side, 600' swath on S side lake

4th flight, 7/22, 1250 gal. 7:38 - 8:34 a.m.

to Kalispell airport to look for NGN, good spray

9th strip, Fish Lake, 2 passes and 3 circles, and Howe Ridge Slope (2-2-2 passes)

5th flight, 7/22, 1250 gallons 853 9:51 a.m.

10 strip down McDonald Creek, 1 boom 300' swath. Pin sheared on right boom, it dripped badly on right side, 11 strip same.

AERIAL OBSERVATION REPORT
Spruce Budworm Control

1. Plane N3N Spray Block Glacier Time 9:52 - 10:25 a.m.
2. Swath width 100 feet
3. Swath location w/respect to previous swath above Avalanche Campground and southwest Avalanche Lake
4. Spray plane height 100 - 150 feet
5. Leaks or plugged nozzles none
6. Spray action Good. Went straight down and into tree tops
7. Spray pattern near lakes or streams stayed away three swaths from Avalanche Lake
8. Is the spray plane in proper block? yes

Date 7-22 1957 Observer Barrows

Remarks:

1. Briefing flight to Avalanche with N3N pilot.
2. 125 gallons in McN left field 10:40 a.m. and 11:20 a.m. sprayed around Avalanche Lake. Insecticide settled in o.k. from 100' height which was sprayed. Temperature on Bonanza-68 degrees, 1 strip sprayed up Canyon at start. 75 at Apgar.

2nd and 3rd flights - Cannavina and Grambo and Cannavina and Eggerman respectively.

Jan. 1957

INDIVIDUAL DAILY SPRAY PLANE RECORD

Plane No. 16298 Pilot Gentry Control Unit Glacier National Park

Block Designation	Date	Insec. gallons	Gasoline	Spray boom leaks	Safety belt	Shldr. straps	Crash helmets	Time		Initials of loader and remarks
								Depart-ure	Return	
Glacier M. P.	7/22	1000	600	No	✓	✓	✓	0141	0517	KE
		1200	400	No	✓	✓	✓	0534	0614	KE Broke Sbars Pin on Pump
		1300	500	No	✓	✓	✓	0655	0725	KE
		1250	500	No	✓	✓	✓	0741	0832	KE
		1250	400	No	✓	✓	✓	0850	0950	KE Closed Operations
Total		6000								

Instructions:

Spray boom leaks -	✓satisfactory	X unsatisfactory
Safety belt -	✓satisfactory	X unsatisfactory
Shoulder straps -	✓satisfactory	X unsatisfactory
Crash helmets -	✓satisfactory	X unsatisfactory

All unsatisfactory items must be brought to satisfactory standard before spray plane leaves the ground.

NFA-SBW Form 6

Jan. 1957

INDIVIDUAL DAILY SPRAY PLANE RECORD

Glacier National Park

Plane No. 4522Pilot Malvern

Control Unit

July 22, 1957

Block Designation	Date	Insec. gallons	Gasoline	Spray boom leaks	Safety belt	Shldr. straps	Crash helmets	Time		Initials of loader and remarks
								Depart-ure	Return	
Glacier National Park	7/22	125.1	46+	No	✓	✓	✓	1040	1120	Arrived F.C.A. 0940
	7/22	125	1	No	✓	✓	✓	1126	1210	
	7/22	125	1	No	✓	✓	✓	1216	1255	

Instructions:

Use separate form for each plane. Block designations - Block number or letter. Date - date spraying accomplished. Insec. gallons - number gallons sprayed by aircraft (from meter reading). Gasoline - Record in 1/4 F (F = full) (tank capacity). The unit supervisor and contractor should agree as to the total gallons of gasoline each plane should carry to allow for 30 minutes flying time in addition to the gallonage of gasoline required to properly deliver the spray load. Gasoline must be loaded to meet this required minimum.

Spray boom leaks - ☒ satisfactory ☐ unsatisfactory
 Safety belt - ☒ satisfactory ☐ unsatisfactory
 Shoulder straps - ☒ satisfactory ☐ unsatisfactory
 Crash helmets - ☒ satisfactory ☐ unsatisfactory

All unsatisfactory items must be brought to satisfactory standard before spray plane leaves the ground.

NFA-SEW Form 5

Jan. 1957

SPRAY PERIOD WEATHER REPORT RECORD

Control Unit Glacier National Park

Observer _____

Date 7/22/57

Location	Time of day	Air temp.	Wind		Remarks
			Direction	Velocity	
Avalanche Lake	0354	55		0	
"	0420	55		0	
Lake McDonald Hotel	0525	60		0	
Avalanche Lake	0530	56		0	
Lake McDonald	0600	56		0	
Upper Lake McDonald H.	0652	58		0	
Upper Lake McDonald H.	0655	59		0	
Avalanche Lake	0737	61		0	
Avalanche Campground	0807	66		0	
Avalanche Lake	0920	67		0	
Avalanche Lake	1020	78			Wind increasing (no measurement)

Instructions for use:

Use form daily.

Location - enter section, township and range or stream, ridge; i.e., NE $\frac{1}{4}$ sec. 16,
T. 6 N., R. 14 W., M.P.M. or East Fork road, mouth of Jennings Creek.

Time - 0300, 0330 or 3:00 a.m., 3:30 a.m.

Air temp. - 68°.

Wind direction - S-SW-NW, etc.

Wind velocity - 1 m/h, 6 m/h, 2 m/h, etc.

Remarks - wind in gusts - wind steady - last reading taken.

Form to be used at all weather stations, portable, stationary and headquarter stations.

Jan. 1957

Control Unit

RECORD OF OBSERVATION ~~GLASS~~ PLANE FLIGHTS

Contractor Heckathorn		Pilot Gail Hanson			Aircraft Boeing		Type and number
Date	Flt. no.	Flying time			Load		Mission
		Out	In	Elapsed	Pass. No.	Frt. #s	
7/22	1	494.5	495.2	42'	2		Observation
	2	495.2	495.9	42'	3		N 8911A
	3	495.9	496.4	30'	2		"
	4	496.4	497.3	54'	2		"
	5	497.3	498.2	54'	2		"
	6	498.2	498.8	36'	2		Briefing pilot
	7	498.8	499.5	42'	2		" "
	8	499.5	500.1	36'	2		Observation Connors & Grando
	9	500.1	500.6	30'	2		Observation Connors & Eggen

Flights authorized by _____

Contractor representative's signature **Ernest J. Grando**Unit supervisor's signature **Gail Heckathorn**INSTRUCTIONS FOR USE**Ernest Grando**

1. Use daily.
2. Under "Flying Time" "Out & In" record reading from aircraft tacometers or "Recording Tac". Allow incoming taxi and parking time only. No warmup time is included. If aircraft do not have recording tacometers, use standard time, allowing time from take off to landing and parking.

Jan. 1957

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CONTROL, Insects, SBW

Glacier Park UnitDate July 22, 1957Daily Spray Coverage Report

(To be phoned to regional office, Division of Timber Management, daily immediately following morning spraying operations. On Saturdays and Sundays, phone report directly to Project Director.)

1. Total acreage (gallons) sprayed today 6375
2. Cumulative total acreage sprayed to date 6375
3. Number of spray planes operated today 2
4. Average length of spray period today
(show to nearest tenth hour) 5.7
5. Remarks (reasons for low output, plane troubles, weather, etc.)

N3N Arrived At 0940

6. Total acreage formally approved to date by
unit biologist and unit supervisor as being
satisfactorily sprayed. 0
7. Total gallons of insecticide metered into
spray planes to date (cumulative total) 6375

K. J. Egernan
Reporting Officer

Control Unit Glacier National Park

INSECTICIDE INVENTORY RECORD

Date	Record of Tanker Bulk Deliveries				Record	
	Waybill Number	Tanker Seal Numbers	Total Gallons		Nozzle	Cumulative readings
			Delivered to project tanks	Cumulative of series		
7/22/57	112	89635	6500	1	125.1	Master 250306
					125.0	250431 250556
					125.0	250681
					20.2	250661

Note: Unit Supervisor or his designated administrative assistant will record deliveries as shown on waybills. Cumulative nozzle meter readings should be recorded at the beginning of operations and at the end of each day's work. Difference between metered output and deliveries will provide approximate inventory record.

Control Unit Glacier National Park

INSECTICIDE INVENTORY RECORD

Date	C-82 Record of Tanker Bulk Deliveries				Dispensing Record		
	Waybill Number	Tanker Seal Numbers	Total Gallons		Project cumulative daily meter readings		
			Delivered to project tanks	Cumulative total of deliveries	Nozzle 1	Nozzle 2	Nozzle 3
7/22/57		89835	6500	1	1000		244306
					1200		245306
					1300		246506
					1250		247806
					1250		249056
					6000		250306

Note: Unit Supervisor or his designated administrative assistant will record deliveries as shown on waybills. Cumulative nozzle meter readings should be recorded at the beginning of operations and at the end of each day's work. Difference between metered output and deliveries will provide approximate inventory record.

